Students, the Net Generation and Digital Natives:Accounting for Educational Change

Book Section

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This chapter examines a number of different terms and popularized accounts of young people who are now at the stage in their lives of engaging in university education across the world. Students are an interesting group because they remove a significant demographic factor that often differentiates groups in society, i.e. educational background (Hargittai 2010). University students also have a generally high level of network connectivity and access to resources. If a digitally aware generation is emerging then this is a social arena in which it has been generally assumed the effects of change will have most effect (Oblinger & Oblinger 2005). Three of the more common terms that have been used to describe this cohort of young people are the Net generation (Tapscott 1998, 2009), Digital Natives (Prensky 2001; 2001a: 2009) and Millennials (Howe and Strauss 2000; Oblinger & Oblinger 2005).

While there are many common strands linking these descriptions each term carries with it some particular features. For example there is no agreed point at which the new generation is said to arise. Tapscott starts the new generation with extreme precision in January 1977 and ends it with a further generational shift into Generation Next in December 1997 (Tapscott 2009 p16). Prensky, however does not specify any particular year whilst other authors using the term Digital Native have been more precise and argued that Digital Natives appear after 1980 (Palfrey & Gasser 2008 p1). Oblinger & Oblinger (2005) following Howe and Strauss (2000) put a precise date on the Millennials suggesting that they were born 'in or after 1982' (Oblinger 2003 p38). Unlike Howe and Strauss, Oblinger and Oblinger also provide an end date for the Millennial grouping in 1991 (Oblinger & Oblinger 2005 2.9). All these authors suggest that the generational boundary is sharp and that a short period of time would make a significant difference to young people's attitudes. Indeed Prensky writes about a 'discontinutity' or 'singularity' marking out this new generation (Prensky 2001).

The literature concerning the Net Generation and Digital Natives provides very little theoretical argument about how this generational effect arises. The argument for a Millennial generation, by contrast, rests on a sweeping historical analysis, which covers most if not all of American (US) history. In *Grown Up Digital* (2009) Tapscott has reported a $4 million dollar research project but

in his writing he draws on no strong theoretical account to explain how an entire generation has developed a distinct and novel set of ideas and approaches to new technology and life more generally (2009 p 1-3). Rather Tapscott tells us that he 'noticed' that his children and their friends were all 'talented' in relation to new technology and that the reason for their talents was that: 'they were the first to grow up surrounded by digital technology' (2009 p2). At a more general level Tapscott provides the following account for generational change: 'Each generation is exposed to a unique set of events that defines their place in history and shapes their outlook.' (2009 p16). An alternative account can be found in the writings of Prensky who developed the idea of the Digital Native, a group who he described by drawing an extended contrast with older Digital Immigrants to describe a similar generational change (2001; 2001a; 2009). The arguments found in both the Net Generation and Digital Natives literature is that the existence of an environment infused with digital and networked technologies and the interaction of young people with that environment on a significant scale leads directly to a generational break between young people and all previous generations.

This chapter critically examines the argument, common to writers using both terms: that the existence of an environment infused with digital and networked technologies, combined with an active engagement in these new technologies, leads directly to a sharp generational break. The chapter goes on to examine the determinist nature of the argument and the way this has been related to one particular pedagogical approach; collaborative learning. It examines the wider social and technological context and in particular the ideas of networked individualism and networked sociality. Finally the chapter concludes by examining which aspects of the Digital Native and Net Generation arguments are worth taking forward and by identifying those aspects of the arguments that need to be abandoned.

Technological determinism

A striking feature of Net Generation and Digital Native discourses is a particular understanding of the relationship between technologies and change. Tapscott (1998 and 2009) has argued that an entire generation of young people is different to previous generational cohorts because of their experience of networked and digital technologies. For over 10 years Tapscott has claimed to identify a generational shift that includes significant changes in attitudes and approaches to learning. Tapscott has suggested that it is because of changes in technology that there have been some 'inevitable' consequences for learning. In particular Tapscott has argued that that the ultimate interactive environment is the Internet itself and that education needs to follow those young people who grew up with the new technologies and move from what he describes as a teacher-centered approach to learning to learner-centered approaches. 'But as we make this

inevitable transition we may best turn to the generation raised on and immersed in new technologies.' (Tapscott 1999 p11). By teacher-centered Tapscott means a transmission model of education in which the teacher or lecturer imparts knowledge to the student. Learner-centered in Tapscott's view places the focus on the individual student's activity.

Prensky using the term Digital Natives (Prensky 2001; 2001a) has also argued that there has been a generational step change in attitudes and styles and that the emergence of Digital Natives leads to a significant change:

> A really big discontinuity has taken place. One might even call it a "singularity" – an event which changes things so fundamentally that there is absolutely no going back. (Prensky 2001 p 1)

Prensky's comments were not limited to students in universities and like Tapscott he identifies an entire generation. Prensky suggests the new generation thinks differently and he goes on to make the claim that the brains of the new generation are different to previous generations (Prensky 2001a). Fundamentally both authors suggest that there has been a generational change caused by a process of technological change.

Technological change is often seen as arising independently and then having an impact on other dependant domains in society. Even when technological change is not seen as independent it is often described as an inevitable outcome of social development. Writing about the discourses that surround children's use of technology in 2003 Selwyn noted that:

> The six different discourses presented in this article also ultimately conform to one of the two dominant paradigms that characterize societal discussion of technology in general. All the stories are underpinned by either a technological or a social determinism, where information technologies are presented as an inevitable consequence of either technological development or the technological needs and requirements of society. (Selwyn 2003 p 367)

Selwyn goes on to note that the problem with such discourse is that they fundamentally fail to reflect the diversity and complexity to be found in real lives. This weakness in the discourse can have real impacts in the way these views are taken up and embedded into policy. It also leads to 'the framing of children, adults and technology within these determinist discourses tends to hide the key shaping actors, the values and power relations behind the increasing use of ICT in society.' (Selwyn 2003 p 368).

A similar problem can be seen in relation to the older population entering university. Students are described as different from their teachers in generational terms and the university as an institution is portrayed as threatened by new Internet based technologies. Change is not an option or a choice it is 'inexorable' an 'imperative':

> Universities are losing their grip on higher learning as the Internet is, inexorably, becoming the dominant infrastructure for knowledge—both as a container and as a global platform for knowledge exchange between people— and as a new generation of students requires a very different model of higher education. Many people have written about this topic, in EDUCAUSE Review and other publications. The transformation of the university is not just a good idea. It is an imperative, and evidence is mounting that the consequences of further delay may be dire. (Tapscott and Williams 2010 p 18)

This rhetoric about the kind of changes required in universities has led Bennett et al. (2008) to argue, in relation to Digital Natives, that the discourse resembles an academic 'moral panic' by restricting critical and rational debate. Moral panic is a term that has arisen to describe conditions in which an identified group in society is portrayed as a threat to social values and norms. The identified group are placed in a media spotlight and often described in sensational terms as a threat to the status quo. Digital Natives and the Net Generation can perform this role in relation to universities and university teaching. Compare the idea of a moral panic with Tapscott and Williams' account of the necessity for radical change:

> Change is required in two vast and interwoven domains that permeate the deep structures and operating model of the university: (1) the value created for the main customers of the university (the students); and (2) the model of production for how that value is created. First we need to toss out the old industrial model of pedagogy (how learning is accomplished) and replace it with a new model called collaborative learning. Second we need an entirely new modus operandi for how the subject matter, course materials, texts, written and spoken word, and other media (the content of higher education) are created. (ibid p10)

The changes they advocate are not minor or superficial; they permeate the 'deep structures and operating model' of the university. Fundamental change in the university is predicated on changes taking place in an identified sub-group in the population, young people identified as a Net Generation of Digital Natives.

> A powerful force to change the university is the students. And sparks are flying today. A huge generational clash is emerging in our institutions. (Tapscott and Williams 2010 p 29).

The determinism is complete, not only are young people determined by their technological environment to become a Net Generation but that generation then becomes the motor for change in universities. According to Tapscott and Williams a generational clash is a major force for university transformation. The criticism of technological determinism in this context is not new (e.g. Buckingham 2006; Herring 2008) and the interests that might influence the popularity of this outlook are not hard to find. Bayne and Ross (2007) identify the role of the market, commercial interests and a one way determinism concerning change in institutions that leads to a deficit model of professional development (see also Jones forthcoming).

Tapscott and Williams offer two solutions to universities, firstly the adoption of collaborative learning and secondly collaborative knowledge building. The first of these has been a longstanding part of the argument that Tapscott has developed around the Net Generation and appeared in his earlier writings (1998). It is in line with arguments that arose with the first introduction of the Internet in university teaching which stressed co-operation and collaboration as the best means of making use of the asynchronous text based media, such as computer conferencing (McConnell 1994; Kaye 1992).The second solution takes things further by arguing for an entirely new *modus operandi* for universities involving the opening up of the institution to allow collaboration amongst institutions and between institutions and the wider world. It would be mistaken to believe that this argument is itself entirely new. The suggestion that students could select from amongst the world's best professors and assemble their own programme of study predated the Internet (Illich 1970) and became a powerful argument in the earliest days of Internet enabled Higher Education (Harasim 1990). In the hands of Tapscott and Williams this argument takes a free market neo-liberal turn, suggesting that private initiative and the market should replace existing models. They retain a role for government in the building of the digital infrastructure, such as broadband networks, that would allow such private commercial approaches to succeed.

Bates (Bates 2010) argues that Tapscott and Williams miss the main point because: 'The interesting question is not what universities should be doing, but why it isn't happening.' (Bates 2010). Bates goes on to question the underlying presumption that Tapscott and Williams which asserts that the problem in Universities is the 'obstructive, non-market-based business models.' (Tapscott and Williams 2010 p 29). Bates' criticism focuses on three main points:

- The 'new' constructivism identified by Tapscott and Williams is not in fact new.

- That constructivist methods require staff student ratios that have been eroded in cost cutting drives for efficiency in universities.
- That privatization would harm some of the most basic and essential functions of university (e.g. knowledge creation and autonomy).

Bates argues that the future of university provision is a choice not a technological requirement, and that while technological change can help in the reform of university teaching and learning, resistance to change arises more from issues of funding, organization and vision than it does from a non-market form of organization. The key question for the purposes of this chapter is in relation to the determinism inherent in Net generation and Digital Natives arguments and it is the issue of choice. To what degree do the technological and age related changes affecting young people leave universities with little or no choice about their future?

Collaborative learning

Technological changes consequent on the development of the Internet have been linked to co-operative and collaborative forms of learning for many years. Computer conferencing was identified in the late 1980s and early 1990s as a technology that inclined users towards cooperative or collaborative learning techniques (Kaye 1995; McConnell 1994; O'Malley 1995). In two complementary texts issued as part of the NATO ASI series, computer conferencing was identified as a key area for research into collaborative methods with its own specific design issues based on the textual and asynchronous nature of the medium (Kaye 1992; O'Malley 1995). In this debate about collaborative learning the contrast was often drawn with the transmission model:

> Learning based on a transmissive or information-processing model of education, where the main learning activity is the individual reception and organisation of information and books, lectures, videos or computer based training materials is not collaborative. (Kaye 1992 p2)

The traditional method of teaching suggested in this contrast with collaboration was the direct transfer of knowledge from the tutor or lecturer by a largely one-way transmission. A common phrase used to describe the changes taking place in teaching and tutoring was; from the 'sage on the stage' to the 'guide on the side'. We might note in passing that the transmissive model, was always something of a gloss. As Macbeth has pointed out education, even in its most traditional form, contains many elements of cooperation and collaboration enabling the transmission of knowledge (Macbeth 1990; 1996).

Tapscott and Williams make similar claims in their recent article, suggesting that the traditional model is a broadcast model and that: ‘A broadcast is, by definition, the transmission of information from transmitter to receiver in a one-way, linear fashion.’ (Tapscott and Williams 2010 p 20). This claim ignores an entire literature that has grown up over many years concerning media consumption that emphasizes the active role of the audience in any broadcast medium.

> At one pole there have been models of media consumption which stress the power of the media (or Cultural industries) and correspondingly treat media audiences as relatively passive and powerless, ‘victims’ of various kinds of media effects. Against this, especially in recent year a variety of approaches have been developed, which lay more or less stress on media consumption, on the active process, in which audience members are understood not only actively to select from the range of media materials available to them but also to be active in the different uses, interpretations and ‘decoding’ of the material which they consume. (Morley 1995 p 296)

Tapscott and Williams are taking a very crude media effects position in which the student audience has a largely passive role.

The audience, in general terms, is by no means passive and co-constructs meaning with the resource transmitted and the sender of that resource. Equally the sender of a message always has an audience in mind and there is a dialogic component to any broadcast (Bahktin 1986). Let us take this further. Any communication is in some sense a broadcast. When I speak to someone, whether they are present or not, I construct a message and transmit it to a prospective receiver. Collaboration rests on this essentially broadcast base. There can be no common understanding without communication and no communication without the mechanism that Tapscott and Williams define as broadcast. Furthermore Tapscott and Williams appear to endorse aspects of broadcast in their collaborative model for universities. Students access video lectures of key professors, faculty share resources and make use of open resources. All these features are adaptations of a broadcast model. Overall this reminds me of the false polarization between metaphors that Sfard criticized using the terms acquisition and participation (Sfard 1998). Sfard argued that:

> When a theory is translated into an instructional prescription, exclusivity becomes the worst enemy of success. Educational practices have an overpowering propensity for extreme, one-for-all practical recipes. A trendy mixture of constructivist, social-interactionist, and situationist approaches - which has much to do with the *participation metaphor* - is often translated into a total banishment of “teaching by telling," an imperative to make "cooperative learning" mandatory to all, and a complete

> delegitimatization of instruction that is not "problem-based" or not situated in a real-life context. But this means putting too much of a good thing into one pot. (Sfard 1998 p 10)

The deterministic argument about the Net Generation has taken a further step with the argument that universities must change in a radical pro-market and neo-liberal fashion in order to meet the challenges posed by the new generation of students. The arguments that Tapscott and Williams (2010) advance are not new, as Bates has already noted (2010). Indeed they reprise arguments that pre-date the emergence of a Net Generation age group and they take the form of a deterministic claim that collaborative learning is an outcome of technological change.

Digital Wisdom

Writing recently about the terms Digital Native and Digital Immigrant Marc Prensky has commented that:

> Although many have found the terms useful, as we move further into the 21st century when all will have grown up in the era of digital technology, the distinction between digital natives and digital immigrants will become less relevant. Clearly, as we work to create and improve the future, we need to imagine a new set of distinctions. I suggest we think in terms of digital wisdom. (Prensky 2009 p 1)

Leaving aside the assumption that all will have grown up in an undifferentiated way in the era of digital technologies, Prensky retains many of his previous arguments. He retains a modified form of the claim that use of digital technologies changes the brain of the user: 'The brains of wisdom seekers of the future will be fundamentally different, in organization and in structure, than our brains are today.' (Prensky 2009 p 1). Furthermore he continues to claim that the use of digital technologies is essential: '…in an unimaginably complex future, the digitally unenhanced person, however wise, will not be able to access the tools of wisdom that will be available to even the least wise digitally enhanced human.' (Prensky 2009 p1). The significant shift Prensky makes is that he now views everyone as moving towards digital enhancement and he has abandoned or more accurately reduced the divide he previously identified between Natives and Immigrants. Prensky defines wisdom, the key term in this turn in his argument: '…as the ability to find practical, creative, contextually appropriate, and emotionally satisfying solutions to complicated human problems.' (Prensky 2009 p2). Prensky sums up this revised position in this way:

> Homo sapiens digital, then, differs from today's human in two key aspects: He or she accepts digital enhancement as an integral fact of human existence, and he or she is digitally wise, both in the considered way he or she accesses the power of digital

> enhancements to complement innate abilities and in the way in which he or she uses enhancements to facilitate wiser decision making. Digital wisdom transcends the generational divide defined by the immigrant/native distinction. (Prensky 2009 p3)

Prensky's revised position is still deterministic, it suggests that digital enhancement is essential, and even though it moves beyond a straightforward divide between Immigrants and Natives the argument retains a simple moral imperative: digital enhancement has to be accepted in order to succeed. The move that Prensky makes is from a hard form of technological determinism, claiming that technology has created the divide between Natives and Immigrants, to a soft form of determinism in which digital enhancement is necessary for everyone if they are to succeed in the new digital world. This determinism links to wider arguments, for example about education and Web 2.0, that encourage panic and a competitive logic focused on social change and the way the demands for a new workforce impact on students.

> As society and the world of work change, the skills that students need to live and thrive in it also change. The competition will be fierce and can come from anywhere in this flat world. In some ways, students today are ahead of their elders. Technology is second nature to them and they accept and use it without question. Schools lag behind. (Solomon and Schrum p17)

While Prensky has softened the edges of the Immigrant-Native divide, he retains a deterministic argument that relies on a technology driven imperative for educational change.

Generations

Howe and Strauss wrote the book *Millennials Rising* (2000) several years after the book they co-authored arguing a general case about generations in the USA. The earlier book *Generations: The History of America's Future and The Fourth Turning: An American Prophecy* (1991) articulated a cyclic view of history that suggested that the history of the United States had followed a regular and predictable pattern since the 16th century. They argue that there are four turnings in a 90 year long cycle with each turning have a length of approximately 22 years. In this context the Millennials are simply a recent outcrop of a long historical process and the fusion of the idea of the Net Generation with the idea of Millennials in the work of Oblinger and Oblinger can be seen as cementing this cyclical generational view into the idea of a Net Generation in education. In Howe and Strauss the length of the period of a saeculum is between 80 and 100 years and it corresponds to a full human life span. The four turnings that occur within a saeculum are periods of just over 20 years and they contain generational cohorts, groups of people who share the same defining experiences. In this context it could be argued that the Net Generation was a purely US phenomena, corresponding to the final generation prior to a new crisis occurring somewhere between 2010 and 2025. Millennials, although described by their digital and

networked technological context, are part of a much more long term process rooted in human history, biology and culture. In this scheme they are just the most recent form of the Civic generation, who are said to be heroic, collegial and rationalistic. Interestingly they are also said to have core values that include community, technology and affluence.

Although it would be far fetched to say that those who use the term Net Generation adhere to this strong generational stance it has had a clear influence on thinking about young people. Oblinger and Oblinger for example clearly build on Howe and Strauss in their book *Educating the Net Generation* (2005 Ch 2). Whilst Oblinger and Oblinger are careful to cautiously state their claims they roughly associate the new generation, drawn directly from Howe and Strauss, with the Net Generation defined in terms of its exposure to technology. The generational argument does not have any real academic support and a review of relevant literature from a Human Resources perspective draws attention to a series of weaknesses, both in the sources of support and the practical implications drawn from the generational argument (Giancola 2006). Empirical work examining the nature of young university students has found that young students entering university are a more complex group than the literature would lead observers to expect (Czerniewicz et al. 2009; Hargittai 2010; Jones et al. 2010; Kennedy et al. 2008). Kennedy et al. (2008) found that in terms of use of technologies, amongst first year Australian students, there was significant diversity when looking beyond the basic and entrenched technologies. They found that the patterns of access to, use of and preference for a range of other technologies varied considerably. In a similar vein Jones et al. (2010) report that English first year students show significant age related variations but these are not generational in character and the Net Generation age group is itself divided internally. Both studies suggest that whilst age is a factor there is no single Net Generation or Digital Native group and that first year university students show a diversity that is inconsistent with a generational hypothesis.

Networked individualism and networked sociality

Castells drawing on work by Wellman has described the social form taken by the network society as networked individualism (Castells 1996; 2001; Wellman 2001; Wellman et al.2003). Wellman has characterized this kind of relationship in relation to community, stressing that community can be found in networks rather than groups:

> In networked societies: boundaries are permeable, interactions are with diverse others, connections switch between multiple networks, and hierarchies can be flatter and recursive. (Wellman 2001 p17)

The term networked individualism suggests a move away from place-to-place interaction towards interactions that are person-to-person in character. The pattern of social life enabled by networked digital technologies is one that allows for a sociability based on the person, connecting people through geographically dispersed social networks. Rather than classic notions of community and collaboration, networked individualism allows for a new network sociality (Wettel 2001). The new networks rely as much on weak ties as they do on the strong ties of traditional groups and communities (Jones 2008).

A related move in education is away from the institutional provision of learning systems, variously called Learning Management Systems (LMS), Course Management Sysems (CMS) and Virtual Learning Environments (VLE), such as Blackboard, WebCT and their open source competitors Moodle and Sakai and towards personal learning environments (PLE) (Weller 2007). This is not a simple move determined by technology and there are significant institutional constraints on how far and how fast such a move can take place (see for example the blog posting from my own university, linking to a course related podcast, Weller 2009). As one might expect in an era of digital scholarship much of the discussion of this topic has taken place in blog postings and so it is difficult to find a peer reviewed reference to stand as a permanent record of the debate. However a recent article by Weller (2010) provides an accessible introduction. A significant aspect of the blog debate is that for all the technological advances referenced in it, it is fundamentally about choice. Choices made about what kind of education we wish to provide and about what kinds of social environments we think are most conducive to teaching and learning. Networked societies may tend in a certain direction but we can choose how to work with these tendencies, we can go along with them or stand in some form of opposition to them.

The emphasis on choice, in terms of the discussion about networked individualism, stands in sharp contrast to the deterministic form that the Net Generation and Digital Natives debate has taken. Bennett and Maton (2010) suggest that networked individualism places the focus on the individual who navigates through their own personal networks. This focus on choice is welcome but it may be insufficient as the choices people make are in conditions that they themselves are not able to control. In a related article Jones and Healing (2010) argue that choice cannot be confined to the individual and that choices are made at various levels of social scale, including in universities departments and whole institutions. Decisions about what kind of infrastructure to provide for students has an impact on the range of choices that students are faced with. Universities may decide to pursue one version or another of the PLE or they may decide that institutional requirements make it important for the university to retain strong institutional boundaries and to resist the pressures that lead to the adoption of personal learning environments in the university.

Discussion – Digital Natives as Digital Phrenology?

In the mid 19th Century the idea that the shape of a person's skull could be related to the development of localized brain functions and character traits related to the mind became popular. The pseudo-science of Phrenology has entered the popular consciousness as an example of an outlandish idea that can become highly popular and resistant to refutation. Indeed it is still possible today to find Phrenology influenced web sites, despite the idea having been systematically undermined for over a century (see for example: http://www.phrenology.org/). Phrenology is interesting because although a flawed approach to a topic it did point towards a significant approach to the brain, the idea that there were localized functions in different parts of the brain. It is also interesting because of its resistance to refutation. For the purposes of this chapter it offers a parallel to the idea of a new Net Generation of Digital Natives. These approaches both point towards potentially significant age related changes in the activities of young people who have grown up in environments that are heavily interpenetrated by digital and networked technologies. The approach they take has however been shown to be a poor predictor of the actual changes taking place as although they have an age related component, and that is perhaps the most important one of several, it does not follow generational lines nor is it universal, applying in all state or regional areas in the same way. Like phrenology it is also highly resistant to refutation. Many of those who are critical of the theories have had the experience of making a presentation that identifies the weaknesses and draws on detailed empirical work only to hear someone who has just endorsed the speaker's comments revert almost immediately to a way of thinking that is deeply ingrained with the idea of a Net Generation being composed of Digital Natives.

There are some good reasons for this persistence. Firstly there is a general need to stereotype in order to reduce complexity and to apply simplified rules of thumb. Perhaps because of this some work has tried to replace the idea of a Net Generation and Digital Natives with a new replacement metaphor such as 'visitors' and 'residents' (see for example the Tall blog: Online Education with the University of Oxford 2008). In this revised metaphor the generational terms 'Immigrants' and 'Natives' are replaced by an experiential divide between 'Residents' and 'Visitors'. A resident spends a proportion of their life online whereas a visitor uses the Web as a tool to address their specific needs. My own view is that this resort to alternative metaphors is a mistake and when I am asked whether there is a better metaphor I always reply that we are best advised to remove the use of metaphors, in this topic area, because they have been so pervasive and misleading. As noted above others have described the terms as part of a 'moral panic' (Bennett et al 2008) and as with all moral panics the idea is that the Net Generation and Digital Native descriptions are part of a disproportionate response by academics to a perceived threat contained in the new digital and networked technologies that are impacting on education and society. Most importantly

the debate about the ideas contained in the Digital Native and Net Generation arguments is closed down, or narrowed, allowing the continued circulation of ideas without supporting evidence. As noted above Buckingham (2006), Herring (2008) and Bayne and Ross (2007) have all pointed to the commercial and market interest in perpetuating the idea of a new generation that requires certain kinds of technological change. Selwyn noted that the persistence of the six discourses he identified in relation to children's use of computers had a relationship to the market:

> Thus it can be argued that the six discursive constructions of child computer users identified in this article are all predominantly attempts to 'sell' information technology to the adult population. (Selwyn 2003 p 368)

There is no doubt that commercial and market interests play a part in the persistence of the Net Generation and Digital Native arguments.

Conclusion

The argument that there is a sharp generational break between a group of young people who are immersed in new technologies, however they are defined and described, and older generational groups who are less familiar with technology, has persisted despite repeated reports of empirical work that undermine the basic case (Czerniewicz et al. 2009; Hargittai 2010; Jones et al. 2010; Kennedy et al.2008). There are potentially two different arguments about the changes taking place amongst young people. The first argument and the one, that is most associated with the idea of the Net Generation and Digital Natives, is that:

- the ubiquitous nature of certain technologies, specifically gaming and the Web, ***has affected the outlook of an entire age cohort*** in advanced economies.

A second related but distinct argument is that:

- The new technologies emerging with this generation have particular characteristics that ***afford certain types of social engagement***.

It is the first of these arguments that we may need to abandon in the face of the empirical evidence. The second argument, like the idea of localized functions of the brain in phrenology, is the rational kernel at the heart of the argument. A good reason why the Net Generation and Digital Native arguments persist is because they draw attention to the way new technologies are changing the approaches that young people take, not in generational ways, but in ways that are significant and require careful observation and assessment.

The idea that technologies simply determine the outlook of an entire generation is one that should be discarded. However the idea that the area of choice in education has been expanded by new technologies is one that still needs to be explored. One of the problems that has arisen out of the Net Generation and Digital Native debate has been a narrowing of the area for debate. Teachers have been identified as being part of a generational group that is distinct from their

young students and it has been argued that the characteristics of the two generational groups was fixed and already known. By shifting our attention to the ways in which technologies open up the potential for new kinds of social engagement the argument moves towards choice and the ways in which technologies might allow for new kinds of educational engagement. Research is showing a more complex set of changes amongst young people than either the Net Generation or Digital Native arguments suggest (Czerniewicz et al. 2009; Jones et al. 2010; Kennedy et al. 2008). This variety amongst young people and the patterns that arise in relation to their use of technologies needs to be explored. As new technologies arise we can expect adoption patterns to vary by age but they may also vary in relation to the time that each technology was first introduced. Adoption patterns are also likely to be affected by other factors such as gender and the different technological infrastructures found in a variety of national and regional contexts. Educational change is not fixed into generational patterns, which themselves are determined by technology, even though the affordances of technology still set the limits to what is possible.

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Short Biography

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Chris has published two edited collections (most recently *Analysing Networked Learning Practices in Higher Education and Continuing Professional Development*, 2009, Sense Publishers), over 60 refereed journal articles, book chapters and conference papers connected to his research.